

12/10/53  
20  
H's ok to enter.

IN THE CLAIMS:

Claim 1 (previously presented) A method of producing a polyuronic acid having an average degree of polymerization less than 20, comprising the steps:

(a) providing a solution containing 5 wt.% or more of a polyuronic acid consisting essentially of a 1,4-linked polyuronic acid block, wherein the polyuronic acid has a weight average molecular weight less than or equal to 50,000 g/mole and is in the form of a lithium salt in amount enough for obtaining the 5 wt.% or more concentration of said salt;

(b) adding hydrogen peroxide and a ferrous salt to the solution prepared in step

(a) to oxidatively degrade the high molecular weight polyuronic acid; and

(c) isolating a polyuronic acid having an average degree of polymerization less than 20 obtained in step (b).

Claim 2 (original) The method of Claim 1 wherein the acidic solution of step (a) has a pH value less than or equal to 5.0 or a pH value at which greater than or equal to 90% of the high molecular weight polyuronic acid is solubilized.

Claim 3 (original) The method of Claim 1 wherein the hydrogen peroxide is added as an aqueous hydrogen peroxide solution.

Claim 4 (previously presented) The method of Claim 1 wherein the amount of hydrogen peroxide is in the range of 20 to 220 mole percent relative to the polyuronic

acid.

Claim 5 (previously presented) The method of Claim 1 wherein the amount of the ferrous salt is in the range of 0.01 to 10 mole percent relative to the hydrogen peroxide.

Claim 6 (original) The method of Claim 1 wherein the reaction in step (b) is an exothermic reaction and after completion of the exothermic reaction step (c) is implemented.

Claim 7 (original) The method of Claim 1 wherein the step (c) comprises: (c1) separating the solution containing the product polyuronic acids from insoluble iron products;  
(c2) precipitating the product polyuronic acids from the solution prepared in step (c1);  
and  
(c3) separating the precipitated polyuronic acids from the mixture prepared in step (c2).

Claim 8 (currently amended) The method of Claim 7 wherein the product polyuronic acids are precipitated from the solution prepared in step (c2) by one or a combination of the following methods:

(1) lowering the pH by addition of an acid so that converts the lithium salt of the polyuronic acid ~~is converted~~ into the free form of the polyuronic acid,

- (2) adding a low molecular weight carboxylic acid,
- (3) adding a low molecular weight alcohol, or
- (4) evaporating the liquid phase.

Claim 9 (original) The method of Claim 8 wherein after addition of an acid the lowered pH value is less than or equal to 3.3.

Claim 10 (original) The method of Claim 8 wherein the low molecular weight carboxylic acid is acetic acid, propionic acid or a mixture thereof.

Claim 11 (original) The method of Claim 8 wherein the low molecular weight alcohol is one or more selected from the group consisting of methanol, ethanol, n-propanol, and isopropanol.

Claim 12 (cancelled)

<sup>12</sup>  
Claim ~~13~~ (previously presented) The method of Claim 1 wherein step (c) is omitted and the product is obtained as a solution containing polyuronic acids, having an average degree of polymerization less than 20.

<sup>13</sup>  
Claim ~~14~~ (previously presented) The method of Claim ~~13~~<sup>12</sup>, further comprising removing insoluble iron products from the solution.

Claims 15 - 24 (cancelled)

<sup>14</sup>  
Claim ~~23~~ (new). The method of claim 8, wherein the acid that converts the lithium salt of the polyuronic acid into the free form of the polyuronic acid is a non-oxidizing acid such that the conversion in step 1 yields a soluble lithium salt.

<sup>15</sup>  
Claim ~~26~~ (new). The method of claim 8, wherein the acid that converts the lithium salt of the polyuronic acid into the free form of the polyuronic acid is selected from the group consisting of hydrochloric acid and a lower molecular weight carboxylic acid.

<sup>16</sup>  
Claim ~~27~~ (new). The method of claim 8, wherein the acid that converts the lithium salt of the polyuronic acid into the free form of the polyuronic acid is selected from the group consisting of hydrochloric acid, acetic acid and propionic acid.